DETAILED ACTION

Response to Amendment

This Office action is in response to Applicant's communication filed February 25, 2011 in response to the Office action dated October 6, 2010. Claims 4, 6-8, and 18-21 have been amended. Claims 1, 3, 5, 9-12, 14, 15, 17, 22, 23, 25, and 26 have been canceled. New claims 27-31 have been added. Claims 4, 6-8, 18-21, and 27-31 are pending in this application.

OBJECTIONS

Claims

1. In view of Applicant's amendment, the objections to **claims 3-8, 10, 11, 15, 17, 21, 23, and 26** are withdrawn.

2. **Claim 30** is objected to because there are two periods at the end of the claim.

REJECTIONS BASED ON PRIOR ART

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 4, 6, 8, 19, 21, 27-29, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Coulson (U.S. Patent Application Publication

2002/0083264) in view of Lee et al. (U.S. Patent Application Publication 2003/0172261) (hereinafter "Lee").

5. **As per claim 27**, Coulson discloses a storage device, comprising:

a casing configured to be compatible with a hard disk drive (paragraph 0018; Fig. 1, element 130);

a connector detachably connectable to a host in accordance with the ATA interface standard (paragraph 0032; Fig. 6, elements 106 and 670);

a control section disposed in said casing and configured to control inputting and outputting of data between the storage device and the host via said connector in accordance with the ATA interface standard (paragraph 0019; Fig. 1, element 137);

a first storage section formed of flash memories disposed in said casing, connected to said control section, and configured to provide a first address space that is allocated with a lower portion of an address space allocated to the storage device as seen from said host (paragraphs 0018 and 0021; Fig. 1, element 135; Fig. 2);

and a second storage section formed of a hard disk drive disposed in said casing, connected to said control section, and configured to provide a second address space that is allocated with an upper portion of the address space allocated to the storage device, said second address space being arranged so as to store application data to be used by an application operating on the host (paragraphs 0018, 0021, and 0027; Fig. 1, element 133; Fig. 2).

Coulson does not expressly disclose said first address space being arranged to store data of a system region for booting an operating system on the host, the data of

the system region including a master boot record, a file management table, and an operating system;

and wherein, upon booting of the host, said host reads data of the system region for booting the operating system from said first address space in said first storage section formed of flash memories and executes the read data to boot the operating system on the host.

Lee discloses said first address space being arranged to store data of a system region for booting an operating system on the host, the data of the system region including a master boot record, a file management table, and an operating system (paragraph 0044; Fig. 2, element 18); *It should be noted that an operating system such as Windows contains a master boot record and a file management table (e.g. FAT).*

and wherein, upon booting of the host, said host reads data of the system region for booting the operating system from said first address space in said first storage section formed of flash memories and executes the read data to boot the operating system on the host (paragraph 0047).

Coulson and Lee are analogous art because they are from the same field of endeavor, that being data storage systems.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to implement Lee's NAND flash which stores boot code and the OS within Coulson's hybrid mass storage system. The motivation for doing so would have been to realize a faster booting speed.

6. **As per claim 28**, Coulson discloses a storage device, comprising:

a casing configured to be compatible with a hard disk drive (paragraph 0018; Fig. 1, element 130);

a connector detachably connectable to a host in accordance with the ATA interface standard (paragraph 0032; Fig. 6, elements 106 and 670);

a control section disposed in said casing and configured to control inputting and outputting of data between the storage device and the host via said connector in accordance with the ATA interface standard (paragraph 0019; Fig. 1, element 137);

a first storage unit formed of flash memories disposed in said casing and connected to said storage section, said first storage unit being configured to provide a first address space that is allocated with a lower portion of an address space allocated to the storage device as a master drive (paragraphs 0018, 0021, and 0027; Fig. 1, element 135; Fig. 2);

and a second storage unit formed of a hard disk drive disposed in said casing and connected to said control section, said second storage unit being configured to provide a second address space that is allocated with an upper portion of the address space allocated to the storage device as a slave drive and arranged to store application data to be used by an application operating on the host (paragraphs 0018 and 0021; Fig. 1, element 133; Fig. 2).

Coulson does not expressly disclose NAND flash memories;

said first address space being arranged to store data of a system region for booting an operating system on the host, the data of the system region including a master boot record, a file management table, and an operating system;

and wherein, upon booting of the host, said host reads data of the system region for booting the operating system from said first address space in said first storage section formed of NAND flash memories and executes the read data to boot the operating system on the host.

Lee discloses NAND flash memories (paragraph 0044);

said first address space being arranged to store data of a system region for booting an operating system on the host, the data of the system region including a master boot record, a file management table, and an operating system (paragraph 0044; Fig. 2, element 18); *It should be noted that an operating system such as Windows contains a master boot record and a file management table (e.g. FAT).*

and wherein, upon booting of the host, said host reads data of the system region for booting the operating system from said first address space in said first storage section formed of NAND flash memories and executes the read data to boot the operating system on the host (paragraph 0047).

Coulson and Lee are analogous art because they are from the same field of endeavor, that being data storage systems.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to implement Lee's NAND flash which stores boot code and the OS within Coulson's hybrid mass storage system. The motivation for doing so would have been to realize a faster booting speed.

7. **As per claim 29**, Coulson discloses a storage system implemented in a computer system having an ATA controller, said storage system comprising:

a casing (paragraph 0028; Fig. 4, element 430);

an interface control section provided for connecting the casing to said ATA controller (paragraph 0029; Fig. 5, elements 450 and 590);

a first storage unit formed of flash memories disposed in said casing and connected to said interface control section, said first storage unit being configured to provide a first address space that is allocated with a lower portion of an address space allocated to the storage device as a master drive (paragraphs 0018, 0021, and 0027; Fig. 1, element 135; Fig. 2);

and a second storage unit formed of a hard disk drive disposed in said casing and connected to said interface control section, said second storage unit being configured to provide a second address space that is allocated with an upper portion of the address space allocated to the storage device as seen from said host, said second address space being arranged as a slave drive and arranged to store application data to be used by an application operating on said computer system (paragraphs 0018, 0021, and 0027; Fig. 1, element 133; Fig. 2).

Coulson does not expressly disclose said first storage unit arranged to store data of a system .region for booting an operating system on said computer system, the data of the system region including a master boot record, a file management table, and an operating system;

and wherein, upon booting of the computer system, said computer system reads, under control of said ATA controller, data of the system region for booting the operating system from said first address space allocated to said first storage unit formed of flash

memories and executes the read data to boot the operating system on the computer system.

Lee discloses said first storage unit arranged to store data of a system .region for booting an operating system on said computer system, the data of the system region including a master boot record, a file management table, and an operating system (paragraph 0044; Fig. 2, element 18); *It should be noted that an operating system such as Windows contains a master boot record and a file management table (e.g. FAT).*

and wherein, upon booting of the computer system, said computer system reads, under control of said controller, data of the system region for booting the operating system from said first address space allocated to said first storage unit formed of flash memories and executes the read data to boot the operating system on the computer system (paragraph 0047).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to implement Lee's NAND flash which stores boot code and the OS within Coulson's hybrid mass storage system. The motivation for doing so would have been to realize a faster booting speed.

8. **As per claim 31**, Coulson discloses a computer system comprising:

a host having an ATA controller (paragraphs 0017 and 0032; Fig. 6, elements 106 and 610);

a storage device detachably connected to the host by way of said ATA controller (paragraph 0018; Fig. 6, element 430);

said storage device being allocated with an address space as seen from said host (paragraph 0021; Fig. 2);

and comprising: a casing (paragraph 0018; Fig. 6, element 430);

a control unit disposed in the casing and detachably connected to said ATA controller (paragraph 0019; Fig. 1, element 137);

a first storage unit formed of flash memories disposed in said casing, said first storage unit being connected to said control unit, configured to provide a first address space which is allocated with a lower portion of an address space allocated to the storage device (paragraphs 0018 and 0021; Fig. 1, element 135; Fig. 2);

a second storage unit formed of a hard disk drive disposed in the casing and connected to said control unit, said second storage unit being configured to provide a second address space allocated with an upper portion of said address space and arranged to store application data to be used by an application operating on under control way of said ATA controller and said control unit (paragraphs 0018 and 0021; Fig. 1, element 133; Fig. 2).

Coulson does not expressly disclose said first storage unit arranged to store data of a system region for booting an operating system on the host, the data of the system region including a master boot record, a file management table, and an operating system;

data of the system region for booting the operating system from said first address space allocated to the first storage unit formed of flash memories and executes the read data to boot the operating system on the host.

Lee discloses said first storage unit arranged to store data of a system region for booting an operating system on the host, the data of the system region including a master boot record, a file management table, and an operating system (paragraph 0044; Fig. 2, element 18); *It should be noted that an operating system such as Windows contains a master boot record and a file management table (e.g. FAT).*

data of the system region for booting the operating system from said first address space allocated to the first storage unit formed of flash memories and executes the read data to boot the operating system on the host (paragraph 0047).

Coulson and Lee are analogous art because they are from the same field of endeavor, that being data storage systems.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to implement Lee's NAND flash which stores boot code and the OS within Coulson's hybrid mass storage system. The motivation for doing so would have been to realize a faster booting speed.

9. **As per claim 4**, the combination of Coulson/Lee discloses wherein a storage capacity of said first storage section is at least 156 M bytes (Coulson, paragraph 0021; Fig. 2).

10. **As per claim 6**, the combination of Coulson/Lee discloses wherein said first storage section is a NAND flash memory (Lee, paragraph 0044; Fig. 1, element 18; Coulson, paragraph 0018; Fig. 1, element 135).

11. **As per claims 8 and 21**, the combination of Coulson/Lee discloses wherein an entirety of the data of the system region is stored in both the first and second storage

sections (Lee, paragraph 0044; Coulson, paragraph 0022; Fig. 5). *It should be noted that since the data of the system region is stored in the first storage section*

12. **As per claim 19**, the combination of Coulson/Lee discloses wherein said first storage unit is configured with NAND flash memories (Lee, paragraph 0044; Fig. 1, element 18; Coulson, paragraph 0018; Fig. 1, element 135).

13. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Coulson in view of Lee and Avraham et al. (U.S. Patent 7,003,620) (hereinafter "Avraham").

14. **As per claim 30**, Coulson discloses a storage device for installation in a computer system having an ATA controller, said storage system comprising:

a casing configured to be compatible with a hard disk drive (paragraph 0018; Fig. 6, element 430);

a control unit disposed in said casing and configured to control inputting and outputting of data between the storage device and a host of the computer system under control of said ATA controller (paragraphs 0017, 0019, and 0032; Fig. 1, element 137; Fig. 6, elements 106 and 610);

a first storage unit formed of flash memories disposed in said casing, said first storage unit being connected to said control unit, configured to provide a first address space which is allocated with a lower portion of an address space allocated to the storage device (paragraphs 0018 and 0021; Fig. 1, element 135; Fig. 2);

a second storage unit formed of a hard disk drive disposed in said casing, said second storage unit being connected to said control unit, configured to provide a second

address space which is allocated with an upper portion of the address space allocated to the storage device as a slave drive, and arranged to store application data to be used by an application operating on the host (paragraphs 0018 and 0021; Fig. 1, element 133; Fig. 2).

Coulson does not expressly disclose said first storage united arranged to store data of a system region for booting an operating system on the host, the data of the system region including a master boot record, a file management table, and an operating system;

a power source monitoring circuit provided with a condenser,

and wherein, upon booting of the host, said host reads, under control of said ATA controller, data of the system region for booting the operating system from said first storage unit formed of flash memories and executes the read data to boot the operating system on the host,

and wherein, upon a sudden power-off being detected, said source power source monitoring circuit maintains a power source voltage for a predetermined time by using an electric charge accumulated in the condenser, and the control unit operates to store file management data temporarily retained at such sudden power-off into the first storage unit formed of flash memories under the power source voltage maintained by the electric charge accumulated in the condenser.

Lee discloses said first storage united arranged to store data of a system region for booting an operating system on the host, the data of the system region including a master boot record, a file management table, and an operating system (paragraph

0044; Fig. 2, element 18); *It should be noted that an operating system such as Windows contains a master boot record and a file management table (e.g. FAT).*

and wherein, upon booting of the host, said host reads, under control of said ATA controller, data of the system region for booting the operating system from said first storage unit formed of flash memories and executes the read data to boot the operating system on the host (paragraph 0047).

Coulson and Lee are analogous art because they are from the same field of endeavor, that being data storage systems.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to implement Lee's NAND flash which stores boot code and the OS within Coulson's hybrid mass storage system. The motivation for doing so would have been to realize a faster booting speed.

The combination of Couslon/Lee does not expressly disclose a power source monitoring circuit provided with a condenser,

and wherein, upon a sudden power-off being detected, said source power source monitoring circuit maintains a power source voltage for a predetermined time by using an electric charge accumulated in the condenser, and the control unit operates to store file management data temporarily retained at such sudden power-off into the first storage unit formed of flash memories under the power source voltage maintained by the electric charge accumulated in the condenser.

Avraham discloses a power source monitoring circuit provided with a condenser (col.8, lines 6-30; Fig. 2, elements 114 and 146); *It should be noted that "capacitor 146" is equivalent to a "condenser".*

and wherein, upon a sudden power-off being detected, said source power source monitoring circuit maintains a power source voltage for a predetermined time by using an electric charge accumulated in the condenser, and the control unit operates to store file management data temporarily retained at such sudden power-off into the first storage unit formed of flash memories under the power source voltage maintained by the electric charge accumulated in the condenser (col. 9, lines 27-34; Fig. 3, elements 304 and 306).

The combination of Coulson/Lee and Avraham are analogous art because they are from the same field of endeavor, that being data storage systems.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to apply Avraham's built-in backup feature to Coulson/Lee's hybrid mass storage system. The motivation to do so would have been to allow reliably caching data while eliminating data loss in case of interruption in the supply of power from a host device.

15. Claims 7 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Coulson and Lee as applied to claims 27 and 29 above, and further in view of Ishida et al. (U.S. Patent Application Publication 2002/0019700) (hereinafter "Ishida").

16. **As per claims 7 and 20**, though more specifically claim 7, the combination of Coulson/Lee discloses all the limitations of the claim except wherein said storage device is used as a storage medium of a car navigation system.

Ishida discloses a car navigation system (paragraph 0040; Fig. 1).

The combination of Coulson/Lee and Ishida are analogous art because they are from the same field of endeavor, that being electronic devices.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to combine Coulson/Lee's hybrid mass storage system and Ishida's car navigation system because all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded the predictable results of realizing a faster booting speed of an operating system in a car navigation system.

17. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Coulson in view of Lee as applied to claims 29 above, and further in view of Kon (U.S. Patent 6,249,838).

18. **As per claim 18**, the combination of Coulson/Lee discloses all the limitations of the claim expect wherein said first storage device and said second storage device are provided in one chassis having a slot, and said first storage device can be detached through said slot.

Kon discloses said first storage device and said second storage device are provided in one chassis having a slot (col. 9, lines 17-27; Fig. 6); *It should be noted that*

the "removable medium hard disk (RMHDD)" is equivalent to a "chassis", a "removable media pack" is equivalent to a "first storage device", and a "flash memory" is equivalent to the "second storage device".

and said first storage device can be detached through said slot (col. 9, lines 21-23; Fig. 6).

The combination of Coulson/Lee and Kon are analogous art because they are from the same field of endeavor, that being data storage systems.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to apply Kon's RMHDD to Coulson/Lee's hybrid mass storage system because all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded the predictable results of a more flexible hybrid mass storage system.

Response to Arguments

19. Applicant's arguments filed February 7, 2011 with respect to **claims 4, 6-8, 18-21, and 27-31** have been considered but are moot in view of the new ground(s) of rejection above.

Conclusion

STATUS OF CLAIMS IN THE APPLICATION

The following is a summary of the treatment and status of all claims in the application as recommended by MPEP 707.70(i):

CLAIMS REJECTED IN THE APPLICATION

Per the instant office action, **claims 4, 6-8, 18-21, and 27-31** have received a first action on the merits and are subject of a final action.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arpan P. Savla whose telephone number is (571)272-1077. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sanjiv Shah can be reached on (571) 272-4098. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Arpan P. Savla/
Examiner, Art Unit 2185

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